Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal

Section 1. General administrative information

Produce Kokanee Salmon In Net Pens For Release Into Lake Roosevelt

Bonneville project number, if an ongoing project 9094

Business name of agency, institution or organization requesting funding
Spokane Tribe of Indians

Business acronym (if appropriate) STOI

Proposal contact person or principal investigator:

Name Keith Underwood
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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Lake Roosevelt Development Association	Route 1, Box 67-F	Davenport, WA 99122	Gene Smith
Spokane Tribal Hatchery	P.O. Box 100	Wellpinit, WA 99040	Tim Peone
Sherman Creek Hatchery (WDFW)	3825 Mellenberger Rd.	Kettle Falls, WA 99141	Mitch Combs

NPPC Program Measure Number(s) which this project addresses.
10.8B.4

NMFS Biological Opinion Number(s) which this project addresses.
N/A

Other planning document references.

N/A

Subbasin.
Upper Columbia River

Short description.
Construct and operate 20 net pens for rearing kokanee salmon (25,000 fish/pen) to post-smolt size in Lake Roosevelt.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
	Anadromous fish	*	Construction		Watershed
X	Resident fish		O & M		Biodiversity/genetics
	Wildlife	X	Production		Population dynamics
	Oceans/estuaries	*	Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other	*	Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.
Kokanee Salmon, Net Pens, Lake Roosevelt

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
9104600	Spokane Tribal Hatchery	O&M provided
9104700	Sherman Creek Hatchery	O&M provided
9500900	Net pen Project	Provides necessary support staff for kokanee net pen project
9404300	Lake Roosevelt Monitoring / Data Collection Program	Kokanee net pens will provide additional fish which will help to achieve goals (both biological and research) of the LRMDCP.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj		Task	

1,2,3	Objective	a,b,c	Task
1	Increase the number of yearling kokanee salmon released into Lake Roosevelt.	a	Construct and place 20 net pens into Lake Roosevelt to raise 500,000 yearling kokanee.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	1/1998	12/1999	99.99%
			TOTAL 99.99%

Schedule constraints.
Time and resources to build net pens are the major constraints to achieving objectives

Completion date.
One year after start of project the O&M will be divided among the Spokane Tribal Hatchery, the Sherman Creek Hatchery and the Rainbow Netpen projects. This will require funds (35,000/yr) to be alloted for this program but distributed to other budgets.

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel	1 part time employee	$15,000
Fringe benefits	32% of salaries	$4,800
Supplies, materials, non-expendable property		$1,000
Operations & maintenance		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	Netpens	$148,557
PIT tags	# of tags:	
Travel		$1,000

Indirect costs	21.3%	$4,643
Subcontracts		
Other		
TOTAL		$175,000

Outyear costs

Outyear costs	**FY2000**	**FY01**	**FY02**	**FY03**
Total budget	$35,000	$35,000	$35,000	$35,000
O&M as % of total	99.99%	99.99%	99.99%	99.99%

Section 6. Abstract

This program is directly called for in Section 10.8B.4 of the 1994 Fish and Wildlife Program, and includes construction and maintenance of 20 net pens for rearing of kokanee salmon in Lake Roosevelt, Washington. The net pens will be supplied with fish from the Spokane Tribal and Sherman Creek Hatcheries as part of mitigation efforts in Lake Roosevelt. The use of net pens will allow more kokanee salmon to be raised to larger (post-smolt) sizes prior to release, as post-smolts are less suceptible to entrainment from Lake Roosevelt. The Lake Roosevelt Monitoring / Data Collection Program (LRMDCP; BPA 9404300) has found net pens to be an effective method of raising rainbow trout that contribute significantly to the creel in Lake Roosevelt. The LRMDCP will monitor and evaluate the success of stocking kokanee salmon from net pens in terms of both survival and their contribution to the creel.

Section 7. Project description

a. Technical and/or scientific background.

The natural production of kokanee and rainbow trout in Lake Roosevelt is limited due to a lack of habitat and prohibitive lake operations. Scholz et al (1986) did the preliminary work addressing the feasibility of restoring a viable fishery in Lake Roosevelt. The artificial production projects were developed to fill the niches not being used in the lake due to a lack of natural production. Current operations of Lake Roosevelt impair or prohibit shore line spawning for most of the sport fish in the lake. Also, Lake Roosevelt is a large body of water with relatively few tributaries. Even if the tributaries were fully seeded they could not produce the number of fish necessary to sustain a fishery of this size of lake. Thus, the artificial production component is a key aspect of managing the fishery in the Lake. Initial tests have been conducted to determine if kokanee can be successfully reared in netpens with promising results.

Kokanee salmon produced in net pens will substitute for lost anadromous fish runs originally blocked by Grand Coulee Dam. Substitution will mitigate losses in place and both in (lost sockeye runs) and out of kind (i.e lost chinook runs). These

substitutions are called for in sections 10.8B.1 and 10.8B.4 in the Fish and Wildlife Program.

b. Proposal objectives.

Program Objective: Greater number of hatchery origin fish harvested by sportsmen and a greater number of adults returning to egg collection facilities.

SPECIFIC MEASURABLE OBJECTIVE:

Table 1. Biological Objectives for Lake Roosevelt.

Species	Stock	Harvest Goal (#)	Escapement Goal (#)	Total Adult Fish (Age 3 or greater) #	lbs	Year Achieved
kokanee	hatchery	290,000	10,000	300,000	2.0	2000
kokanee (adfluvial)	wild	120,000	60,000	180,000	1.5	*

* = target date will be determined upon completion of baseline investigations.

Entrainment, predation, and harvest can have a significant impact on kokanee salmon survival (Cichosz et al. 1997, Underwood and Shields 1996). To achieve the biological objectives for adult kokanee salmon production (Table 1), kokanee salmon need to be produced in substantially greater numbers than is possible in existing hatcheries dedicated to Lake Roosevelt fish production. The construction and use of the proposed net pens will result in the production of approximately 500,000 additional kokanee salmon annually for release into Lake Roosevelt.

c. Rationale and significance to Regional Programs.

Program Hypothesis: Net pen reared kokanee salmon will contribute to the creel and to egg collection efforts.

Program Objective: Greater number of hatchery origin fish harvested by sportsmen and a greater number of adults returning to egg collection facilities.

This program is directly called for in Section 10.8 (Specifically Section(s) 10.8B.1 and 10.8B.4) of the 1994 Fish and Wildlife Program and addresses the resident fish substitutions as mitigation for lost anadromous fish runs. Section 10.8B.4 specifically designates the use of 20 net pens for rearing of kokanee salmon within Lake Roosevelt to meet FWP objectives. Net pen production of rainbow trout (BPA No. 9500900) has been very successful in Lake Roosevelt to date, and sets a precedence for the successful use of net pens in fish production. Current use of net pens for rainbow

trout production results in predefined designs for net pen construction and mooring that will be successful in Lake Roosevelt.

d. Project history

N/A

e. Methods.

The primary tasks associated with this program will be construction and maintenance of the net pens, and feeding of fish within the pens. Kokanee salmon will be supplied by the Spokane Tribal and Sherman Creek Hatcheries without interfering with normal hatchery operations. The assumption(s) of the program is that lake operations will allow for net pen operations until late June or July each year. The construction and successful use of movable mooring anchors for rainbow trout net pens during 1997 suggests that this assumption will not be a major concern for kokanee net pens. Monitoring and evaluation of the program success will be conducted as part of the Lake Roosevelt Monitoring / Data Collection Program.

f. Facilities and equipment.

Construction and maintenance responsibilities for kokanee net pens will be shared by the Spokane Tribal and Sherman Creek Hatcheries and the Lake Roosevelt Development Association (LRDA). The LRDA is a non profit organization that currently operates and maintains the rainbow trout net pens in Lake Roosevelt. These three entities possess all necessary equipment and facilities to construct, stock and maintain the kokanee net pens in Lake Roosevelt.

g. References.

Cichosz, T.A., J.P. Shields and K.D. Underwood. In Press. Lake Roosevelt Monitoring / Data Collection Program. Annual Report 1996. Bonneville Power Administration, Portland, Oregon. Project No. 94-43.

Scholz, A.T., J.K. Uehara, J. Hisata, and J. Marco. 1986. Feasibility report on restoration and enhancement of Lake Roosevelt Fisheries. In: Northwest Power Planning Council, Application for amendments. Vol. 3A:1375-1489.

Underwood, K.D. and J.P. Shields. 1996. Lake Roosevelt Fisheries Monitoring Program, annual report 1993. Bonneville Power Administration. Portland, Oregon. Project No. 88-63.

Section 8. Relationships to other projects

This program will be related to the following programs in that all aim to improve or supplement the Lake Roosevelt fishery as directed under the resident fish section(s) of the 1994 FWP.

The Lake Roosevelt Monitoring / Data Collection Program (BPA No. 9404300)
Spokane Tribal Hatchery (BPA No. 9104600)
Sherman Creek Hatchery (BPA No. 9104700)
Lake Roosevelt Net Pen Project (BPA No. 9500900)
The Habitat Improvement Project (BPA No. 9001800)
Chief Joseph Kokanee Enhancement Project (BPA No. 9501100)
Lake Roosevelt Sturgeon Project (BPA No.9502700)
Native Fish Stock Status (NPPC No. 10.8B.26).

Section 9. Key personnel

Keith Underwood, Program Manager (see resume in proposal for BPA 9404300);
Tim Peone, Hatchery Manager, Spokane Tribal Hatchery (see resume in proposal for BPA 9104600);
Mitch Combs, Hatchery Manager, Sherman Creek Hatchery (see resume in proposal for BPA 9104700);
Gene Smith, Net Pen Coordinator, Lake Roosevelt Development Association (see resume in proposal for BPA 9500900)

Section 10. Information/technology transfer

Results of the kokanee net pen program will be reported in program specific annual reports to BPA. Evaluation of program success will be reported in annual reports to BPA by the Lake Roosevelt Monitoring / Data collection Program.